

1. *Chlorophyll a* (Chl *a*) is the primary photosynthetic pigment in most plants and algae. It is a green pigment that absorbs light energy in the blue and red regions of the visible spectrum. Chl *a* is essential for the light-dependent reactions of photosynthesis, where it converts light energy into chemical energy.

2. *Chlorophyll b* (Chl *b*) is an accessory pigment found in green plants and algae. It is a yellow-green pigment that absorbs light energy in the blue and orange regions of the visible spectrum. Chl *b* transfers the absorbed energy to Chl *a* for use in photosynthesis.

3. *Carotenoids* are a group of pigments that include carotenes and xanthophylls. They are responsible for the yellow, orange, and red colors seen in autumn foliage. Carotenoids absorb light energy in the blue and green regions of the visible spectrum and transfer the energy to Chl *a*. They also play a role in protecting the photosynthetic apparatus from damage by reactive oxygen species.

4. *Xanthophylls* are a subclass of carotenoids that are involved in the xanthophyll cycle. This cycle helps regulate the amount of light energy absorbed by the photosynthetic apparatus, preventing damage from excessive light. Xanthophylls can be converted to zeaxanthin under high light conditions.

5. *Anthocyanins* are water-soluble pigments that give plants their red, purple, and blue colors. They are not directly involved in photosynthesis but can play a role in protecting the plant from stress, such as UV radiation and herbivory.

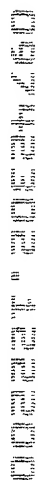
6. *Phycobilins* are pigments found in cyanobacteria and red algae. They are responsible for the blue, green, and red colors seen in these organisms. Phycobilins absorb light energy in the blue and green regions of the visible spectrum and transfer the energy to Chl *a*.

7. *Phenolic compounds* are a large group of secondary metabolites found in plants. They include flavonoids, tannins, and lignins. Phenolic compounds can have various functions, including acting as antioxidants, protecting the plant from stress, and providing structural support.

8. *Flavonoids* are a subclass of phenolic compounds that are responsible for the yellow, orange, and red colors seen in many flowers and fruits. They can also act as antioxidants and protect the plant from stress.

9. *Tannins* are a subclass of phenolic compounds that can bind to proteins and other molecules, affecting their function. They are often found in the leaves and stems of plants and can act as a defense mechanism against herbivory.

10. *Lignins* are complex polymers that provide structural support to the cell walls of plants. They are found in the stems, roots, and leaves of many plants and are responsible for the woody texture of trees.



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4. *Xanthophylls* are a subclass of carotenoids that are involved in the xanthophyll cycle. This cycle is a protective mechanism that helps plants cope with excess light energy. Xanthophylls can be converted to zeaxanthin, which then dissipates excess energy as heat, preventing damage to the photosynthetic system.

5. *Anthocyanins* are water-soluble pigments that give plants their red, purple, and blue colors. They are not directly involved in photosynthesis but are thought to play a role in attracting pollinators and protecting plants from herbivores and environmental stress.

